

## **REMARKS**

In the Office Action, the Examiner rejected claims 21-35 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 6,150,193 to Glenn (Glenn). In this Amendment, Applicants have amended claims 26 and 35, canceled claims 21-25, and added new claims 48-60. Applicants have not canceled, added, or amended any other claim. Accordingly, claims 26-35 and 48-60 will be pending in the application after entry of this Amendment.

### **I. Rejection of claims 26-34 under §102(e)**

The Examiner rejected claims 26-34 under §102(e) as being anticipated by Glenn. Claims 27-34 are dependent on claim 26. Claim 26 recites an integrated circuit (IC) that has at least one metal layer. Applicants have amended this claim to recite that the metal layer has at least one thousand conductors effectively deposited in an effective preferred direction to interconnect one or more points within the IC. *See* amended claim 26 on page 2 of this paper. *See also* Figure 15 and paragraph 70 of the specification. Figure 15 shows a plurality of conductors deposited in an effective preferred direction. The effective preferred direction has a direction for at least forty percent of the conductors on the metal layer. Each conductor has first and second wires. The first wire has first and second ends and is deposited in a Manhattan direction relative to the boundaries of the IC. The second wire has first and second ends and is deposited in a diagonal direction relative to the boundaries of the IC. The first end of the second wire is coupled to the second end of the first wire. The effective preferred direction of each conductor is an angle A, measured

relative to the boundaries of the IC. Angle A is determined by the effective preferred direction of the metal layer and the angle is defined by the expression  $\tan A = Y/X$ .

Y is a line segment with a distance starting from the second end of the second wire and ending at an intersection with a line segment propagated from the first end of the first wire and in the direction of the first wire. X is a distance measured in the direction of the first wire starting from the first end of the first wire and ending with the intersection of the Y line segment.

Applicants respectfully submit that Glenn does not disclose, teach, or even suggest such an IC. For instance, Glenn does not disclose, teach, or even suggest an IC that has:

- at least one metal layer with at least one thousand conductors effectively deposited in an effective preferred direction to interconnect one or more points within the IC;
- an effective preferred direction that has a direction for at least forty percent of the conductors on the metal layer;
- an effective preferred direction of each conductor that has an angle A, measured relative to the boundaries of the IC; and
- an angle A that is determined by the effective preferred direction of the metal layer and the angle is defined by the expression  $\tan A = Y/X$ .

The Examiner states that Glenn's FIG.7C and FIG.8C disclose all of the limitations of claim 26. Glenn shows a shielded package for an IC with an insulating substrate having metallizations formed on a surface of the substrate. *See* Glenn Abstract. Thus, Glenn specifically describes and shows metallizations that are coupled to the exterior bonding pads of an IC. Also, Glenn specifically shows metallizations in each partition of a shielded package that have a variety of orientations and directions. *See* Glenn FIG.7C and FIG.8C.

However, Glenn does not disclose a metal layer of an IC. Nor does Glenn disclose the interior components, routes, or connections of an IC because Glenn shows an exterior package for shielding an IC. Further, Glenn does not disclose, teach, or even suggest at least one thousand conductors in an effective preferred direction of a metal layer to interconnect one or more points within the IC. Moreover, since Glenn's FIG.7C and FIG.8C do not show a preferred direction, using the bonding pad metallization pattern shown in these figures would be an extremely inefficient and counterproductive routing pattern for a metal layer of an IC. Thus, Applicants respectfully submit that the IC and the routing within the IC recited in claim 26 are patentably distinct from Glenn's package and bonding pad metallizations.

Accordingly, Applicants respectfully submit that Glenn does not anticipate claim 26, nor otherwise invalidate this claim. As claims 27-34 are dependent on claim 26, Applicants respectfully submit that Glenn does not anticipate, nor otherwise invalidate claims 27-34 for at least the reasons discussed above in relation to claim 26. In view of

the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102(e) rejection of claims 26-34.

### **III. Rejection of claim 35 under §102(e)**

The Examiner rejected claim 35 under §102(e) as being anticipated by Glenn. Claim 35 recites a method for simulating any wiring direction in an IC using wires deposited in diagonal and Manhattan directions. The method selects an effective direction that has an angle A that is measured relative to the boundaries of the IC. The angle A is defined by the expression  $\tan A = Y/X$ .

The method provides at least one metal layer that has several conductors effectively deposited in the effective direction to interconnect one or more points within the IC. The method deposits a first wire with first and second ends in a Manhattan direction relative to the boundaries of the IC. The method deposits a second wire with first and second ends in a diagonal direction relative to the boundaries of the IC. The method couples the first end of the second wire to the second end of the first wire by using the angle A to achieve the effective direction.

Y is a line segment with a distance starting from the second end of the second wire and ending at an intersection with a line segment propagated from the first end of the first wire and in the direction of the first wire. X is a distance measured in the direction of the first wire starting from the first end of the first wire and ending with the intersection of the Y line segment.

Applicants respectfully submit that Glenn does not disclose, teach, or even suggest such a method. For instance, Glenn does not disclose, teach, or even suggest a method for simulating any wiring direction in an IC using wires deposited in diagonal and Manhattan directions by:

- selecting an effective direction that has an angle A, defined by the expression  $\tan A = Y/X$ , that is measured relative to the boundaries of the IC;
- providing at least one metal layer that has several conductors effectively deposited in the effective direction to interconnect one or more points within the IC;
- depositing a first wire with first and second ends in a Manhattan direction relative to the boundaries of the IC;
- depositing a second wire with first and second ends in a diagonal direction relative to the boundaries of the IC;
- coupling the first end of the second wire to the second end of the first wire by using the angle A to achieve the effective direction.

Glenn describes an exterior package for shielding an IC with an insulating substrate having metallizations formed on a surface of the substrate to couple the bonding pads of the IC. Thus, Glenn specifically describes and shows metallizations that are coupled to the exterior bonding pads of an IC. Glenn's metallizations are all in various

disparate orientations and directions and have no particular effective direction. Accordingly, Glenn does not discuss a method for simulating any wiring direction inside an IC. Nor does Glenn discuss the interior components, routes, or connections of an IC because Glenn shows an exterior package for shielding an IC. Glenn merely shows one arbitrary bonding pad metallization pattern on a package and does not disclose a method of simulating any angle wiring by affirmatively taking the steps of selecting a direction that has an angle, depositing first and second wires, and coupling the wires by using the angle to achieve the selected direction. Therefore, Glenn not only fails to disclose a method of simulating any angle wiring, it also contains no discussion of an effective preferred direction or an angle A that is defined by the expression  $\tan A = Y/X$ .

Thus, Applicants respectfully submit that the method of routing within an IC recited in claim 35 is patentably distinct from Glenn's unmethodical and arbitrary bonding pad metallization pattern. Accordingly, Applicants respectfully submit that Glenn neither anticipates, nor otherwise invalidates, the method recited in claim 35. As new claims 48-55 are dependent on claim 35, Applicants respectfully submit that new claims 48-55 are patentably distinct from Glenn for at least the reasons discussed above in relation to claim 35. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102(e) rejection of claim 35 and examination and allowance of new dependent claims 48-55.

#### **IV. New claims 56-60**

Applicants have added new claims 56-60. Claims 57-60 are dependent on claim 56. Claim 56 recites an IC that has a metal layer. The IC also has a set of at least ten

routes on the metal layer. Each particular route on the metal layer is formed by two sets of wire segments that alternate along only two directions. Each set of wire segments only has wires along one of the two directions. The two directions are neither parallel nor perpendicular.

Applicants respectfully submit that Glenn does not disclose, teach, or even suggest such an IC. For instance, Glenn does not disclose, teach, or even suggest and IC that has:

- a set of at least ten routes on a metal layer, where each particular route is formed by two sets of wire segments that alternate along only two directions;
- where each set of wire segments only has wires along one of the two directions; and
- where the two directions are neither parallel nor perpendicular.

Accordingly, Glenn does not anticipate new claim 56, nor otherwise invalidate this claim. Since new claims 57-60 are dependent on new claim 56, Applicants respectfully submit that Glenn does not anticipate, nor otherwise invalidate claims 57-60 for at least the same reasons as for claim 56. In view of the foregoing, Applicants respectfully request examination and allowance of new claims 56-60.

**CONCLUSION**

In view of the foregoing, it is submitted that all claims, namely claims 26-35 and 48-60, are in condition for allowance. Reconsideration of the rejections is requested. Allowance is earnestly solicited at the earliest possible date.

Respectfully submitted,

Dated: 07/26/2004

  
Andy T. Pho  
Reg. No. 48,862

Stattler Johansen & Adeli LLP  
PO Box 51860  
Palo Alto, CA 94303-0728  
Phone: (650) 752-0990  
Fax: (650) 752-0995